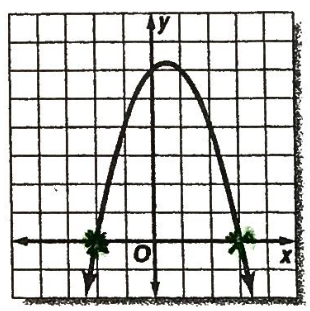
Notes - Finding Solutions by Graphing

Solutions = x-intercepts (where the graph crosses the x-axis)

They are also called roots or zeros because they happen where $y = 0$.

Example of finding solutions by graphing:

The graph of the quadratic function $f(x) = -x^2 + x + 6$ is shown at the right. Use the graph to find the solutions of the quadratic equation $-x^2 + x + 6 = 0$.



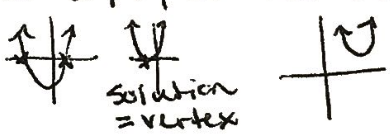
Just find the x-intercepts!

$\boxed{\text{The solutions are } (-2, 0) \text{ and } (3, 0)}$

You could also write this as $x = -2, 3$

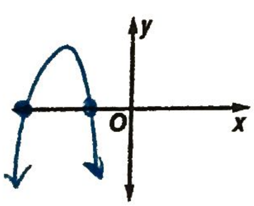
but NOT $(-2, 3)$

- Quadratic functions can have 2, 1, or no real solutions

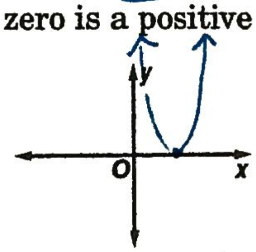


Sketch a graph to illustrate each situation.

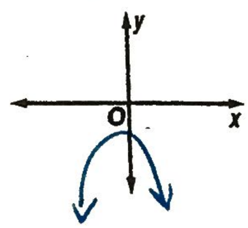
a. A parabola that opens downward and represents a quadratic function with two real zeros, both of which are negative numbers.



b. A parabola that opens upward and represents a quadratic function with exactly one real zero. The zero is a positive number.



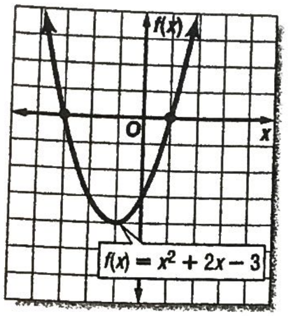
c. A parabola that opens downward and represents a quadratic function with no real zeros.



Solving Quadratic Equations By Graphing

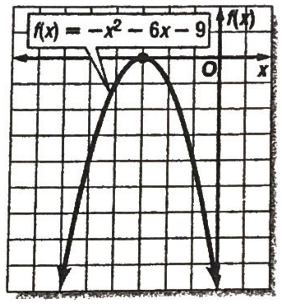
Use the related graph of each equation to determine its solutions.

1. $x^2 + 2x - 3 = 0$



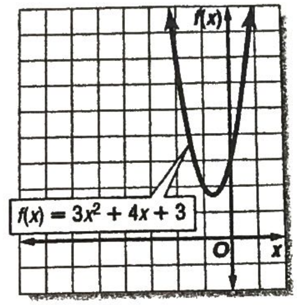
(-3,0) (1,0)

2. $-x^2 - 6x - 9 = 0$



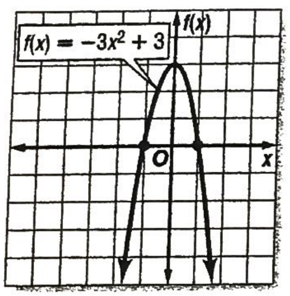
(-3,0)

3. $3x^2 + 4x + 3 = 0$



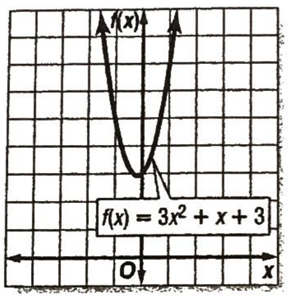
no real solutions

4. $-3x^2 + 3 = 0$



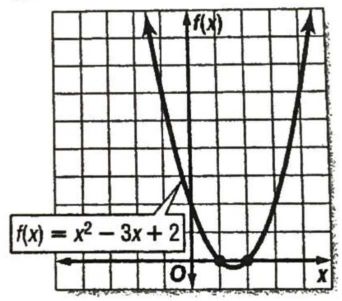
(-1,0) (1,0)

5 $3x^2 + x + 3 = 0$



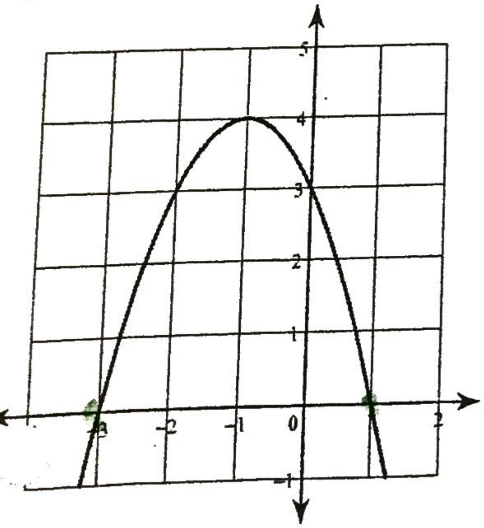
no real solutions

6 $x^2 - 3x + 2 = 0$



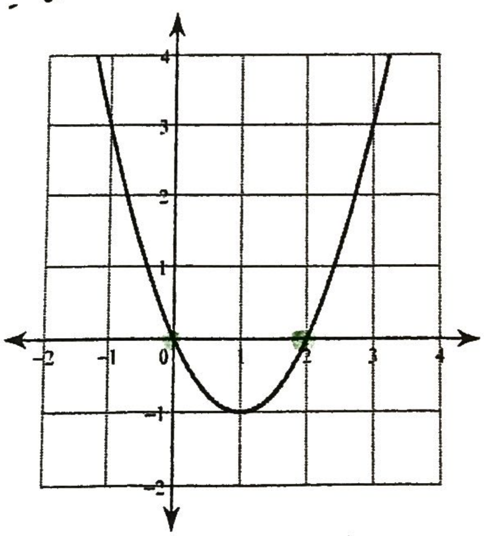
(1,0) (2,0)

7.



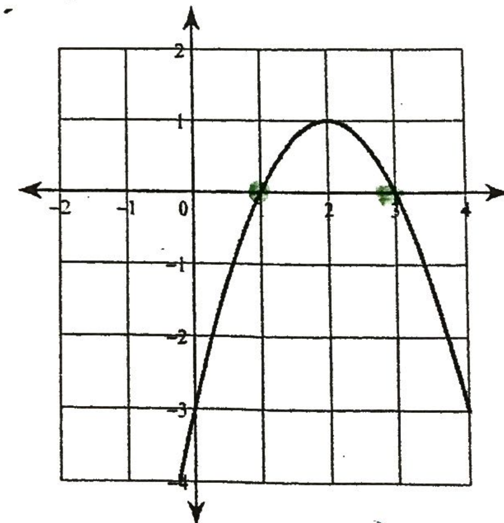
(-3,0) (1,0)

8.



(0,0) (2,0)

9.



(1,0) (3,0)